Med (Zenica) Glas

Medicinski Glasnik

ISSN 1840-2445 (Online); ISSN 1840-0132 (Print)

Medical Association of Zenica-Doboj Canton

Included by: PubMed (MEDLINE), SCOPUS, EMBASE, CNKI and DOAJ.

Med Glas (Zenica) publishes a "First Online" version as a free service to authors to accelerate the dissemination of scientific findings as soon as possible after acceptance, following peer review and any necessary revisions. The "First Online" manuscript appears online prior to copyediting, formatting/typesetting, and author proofreading, but it is fully citable via its Digital Object Identifier (DOI). However, this "Ahead of Print" version is NOT the final version of the manuscript. Once the final, copyedited, and fully paginated version is published in a journal issue, it will be accessible through the same DOI and the "Ahead of Print" version will be replaced.

| | |
|---|---|
| **Type of the paper:** | **ORIGINAL ARTICLE** |
| **Running title:** | **Herenda et al.** Workplace violence against physicians |
| **Title:** | **Frequency, perpetrators, and institutional response to workplace violence against physicians: a questionnaire survey in Sarajevo Canton** |
| **Authors:** | Vedad Herenda[1,2*], Elvedina Žiga[3], Dženana Hrlović[4] |
| **Affiliations:** | [1]Clinic for Nephrology, Clinical Centre University of Sarajevo, Sarajevo, Bosnia and Herzegovina; [2]Sarajevo Medical School, Sarajevo School of Science and Technology, Sarajevo, Bosnia and Herzegovina; [3]Institute of Public Health of the Federation of Bosnia and Herzegovina, Sarajevo, Bosnia and Herzegovina; [4]Independent Researcher, Sarajevo, Bosnia and Herzegovina |
| **Corresponding author:** | Vedad Herenda, Clinic for Nephrology, Clinical Centre University of Sarajevo, Bolnička 25, 71000 Sarajevo, Bosnia and Herzegovina<br>Phone: +387 33 297 400<br>E-mail: vedad.herenda@gmail.com |
| **DOI:** | https://doi.org/10.17392/medglas24754 |

**Received**: 13 May 2026
**Revised:** 10 August 2026
**Accepted:** 11 August 2026

ORIGINAL ARTICLE

# Frequency, perpetrators, and institutional response to workplace violence against physicians: a questionnaire survey in Sarajevo Canton

Vedad Herenda[1,2*], Elvedina Žiga[3], Dženana Hrlović[4]

[1]Clinic for Nephrology, Clinical Centre, University of Sarajevo, Sarajevo, Bosnia and Herzegovina; [2]Sarajevo Medical School, Sarajevo School of Science and Technology, Sarajevo, Bosnia and Herzegovina; [3]Institute of Public Health of the Federation of Bosnia and Herzegovina; Sarajevo, Bosnia and Herzegovina; [4]Independent Researcher, Sarajevo, Bosnia and Herzegovina

**Running title: Herenda et al.** Workplace violence against physicians

*** Correspondence:**

Vedad Herenda

Clinic for Nephrology, Clinical Centre, University of Sarajevo

Bolnička 25, 71000 Sarajevo, Bosnia and Herzegovina

Phone: +387 33 297 400

E-mail: vedad.herenda@gmail.com

ORCID: 0000-0002-5640-1474

Pre-proof Med Glas (Zenica)

## ABSTRACT

**Aim:** To estimate the frequency and patterns of workplace violence (WPV), identify reported perpetrators, and assess institutional responses among physicians responding to a survey in Sarajevo Canton.

**Methods:** This anonymous cross-sectional online survey was distributed to 1,354 licensed physicians between 19 May and 19 June 2023. The questionnaire was adapted from the Workplace Violence in the Health Sector instrument. Descriptive analyses, exact tests, Spearman rank correlation, and multivariable logistic regression were used.

**Results:** Overall, 117 physicians responded (8.6%). Lifetime and 12-month WPV were reported by 109 (93.2%) and 81 (69.2%), respectively. Twelve-month verbal WPV was more frequent in primary care than in secondary or tertiary care (86.2% vs 55.0% and 57.1%; $p = 0.002$). Compared with primary care, secondary and tertiary care were associated with lower adjusted odds of 12-month WPV (OR 0.19, 95% CI 0.06–0.66; OR 0.24, 95% CI 0.08–0.69, respectively). Satisfaction with institutional handling of verbal violence was inversely correlated with concern about WPV ($\rho = -0.357$; $p = 0.001$).

**Conclusion:** WPV was frequently reported by respondents, particularly in primary care, and satisfaction with institutional responses was low. The low response rate limits population-level inference and generalisability. Standardised reporting and prevention protocols should be evaluated in representative studies.

**Keywords:** Bosnia and Herzegovina; cross-sectional studies; health personnel; occupational health; professional-patient relations

Pre-proof Med Glas (Zenica)

## INTRODUCTION

Workplace violence (WPV) comprises incidents in which workers are abused, threatened, or assaulted in circumstances related to their work, and includes physical and psychological forms, such as verbal abuse, threats, and harassment (1,2). Healthcare workers are disproportionately exposed because of frequent contact with patients and accompanying persons, organisational pressures, and emotionally charged clinical encounters (3–6). Patients and their relatives are commonly reported as perpetrators, while normalisation of violence as "part of the job" contributes to underreporting (6–12).

The reported prevalence of WPV varies across settings because of differences in health-system organisation, culture, measurement, reporting practices, and legal protections (11). Evidence from Bosnia and Herzegovina is limited. A study in Sarajevo primary care documented frequent WPV among healthcare workers (13), while a recent national report indicated a substantial burden, particularly in primary care (14).

Physicians may face specific exposures related to communication, triage, gatekeeping, medico-legal responsibility, and the delivery of adverse information (15). However, evidence focused specifically on physicians across healthcare levels in Sarajevo Canton remains limited.

This study aimed to estimate the frequency and patterns of WPV among responding physicians in Sarajevo Canton, identify reported perpetrators, examine differences across healthcare level, and assess perceptions of institutional responses.

## MATERIAL AND METHODS

### Subjects and study design

This cross-sectional online survey was conducted from 19 May to 19 June 2023 among physicians working in Sarajevo Canton. The investigators contacted 12 professional healthcare organisations to request assistance with recruitment; only the Medical Association

Pre-proof Med Glas (Zenica)

of Sarajevo Canton agreed to distribute the survey. The investigators had no direct contact with potential participants.

The Medical Association emailed one survey invitation to 1,354 licensed, currently active physicians using verified addresses on its membership list. No duplicate or undeliverable addresses were identified, and no reminder emails were sent. Eligible participants worked in public or private healthcare institutions in Sarajevo Canton. A total of 117 complete questionnaires were included. Participation was voluntary, and responses were collected anonymously.

These data derive from the same 2023 nationwide survey of healthcare workers in Bosnia and Herzegovina reported previously (14). The present analysis is restricted to physicians practising in Sarajevo Canton (n = 117 of 228 national respondents).

## Methods

Data were collected using a Google Forms questionnaire that remained open for 30 days. The landing page described the study purpose, voluntary participation, anonymity, intended publication of results, and data handling. Proceeding beyond the landing page to the questionnaire constituted electronic informed consent; no separate affirmative checkbox was used.

The survey did not collect patient information, medical records, or directly identifying participant data. Ethical oversight and the basis for approval or exemption are reported in the Ethics statement.

The survey assessed WPV during the preceding 12 months and over participants' careers. Physical violence included hitting, kicking, slapping, stabbing, shooting, shoving, and biting. Verbal violence included yelling, cursing, and threats.

The questionnaire was based on the *Workplace Violence in the Health Sector Country Case Study Research Instruments Survey Questionnaire* developed by the International Labour

Pre-proof Med Glas (Zenica)

Office, International Council of Nurses, World Health Organization, and Public Services International (16). It was adapted to the healthcare context of Sarajevo Canton.

The questionnaire was translated into Bosnian by two of the authors (forward translation), following established guidelines for the cross-cultural adaptation of self-report measures (17). No formal reconciliation process, back-translation, or pilot testing was performed. An independent psychologist reviewed the adapted version for content and face validity. No formal assessment of reliability (e.g., internal consistency) or validity was conducted.

The 59-item questionnaire was organised into nine Google Forms sections corresponding to five content domains: demographic and professional characteristics, including sex, age, healthcare level, professional position, and years of experience; general perceptions of WPV among healthcare workers; physical violence, including occurrence, circumstances, responses, and perceived impact; verbal violence, including occurrence, circumstances, responses, and perceived impact; and opinions on prevention and institutional support.

The questionnaire also assessed concern about WPV, satisfaction with institutional responses, and perceived causes and preventive measures. The complete administered questionnaire, with English translation, response options, and skip logic, is provided as Supplementary Material.

Before accessing the questionnaire, all respondents viewed a landing page stating the study purpose, voluntary participation, the right to withdraw, confidentiality of results, and contact details for the lead author. The page stated that proceeding to the survey constituted informed consent. No respondent could access questionnaire items without first viewing this page.

Concern about WPV and satisfaction with institutional handling of physical and verbal WPV were each assessed on a 5-point scale (1 = not at all concerned/satisfied; 5 = very concerned/satisfied). Given the ordinal nature of these items, both mean ± standard deviation (SD) and median with interquartile range (IQR) are reported.

Pre-proof Med Glas (Zenica)

## Statistical analysis

Analyses were performed using IBM SPSS Statistics for Windows, version 27.0 (IBM Corp., Armonk, NY, USA). Categorical data are presented as n (%). Pearson's $\chi^2$ test was used when assumptions were met; Fisher's exact or Fisher–Freeman–Halton exact tests were used when expected cell counts were < 5. Spearman's rank correlation was used for ordinal variables. Multivariable logistic regression examined healthcare level, sex, and age group in relation to WPV during the preceding 12 months. The outcome was coded 1 = yes and 0 = no; predictors were entered a priori, age group was modelled as an ordinal one-category increment, and complete-case analysis included n = 110 (78 events and 32 non-events). Multicollinearity, calibration, and discrimination were assessed. Results are reported as odds ratios (ORs) with 95% confidence intervals (CIs); tests were two-sided and $p < 0.05$ was considered significant. Cochran's formula with finite-population correction (N = 1,354), expected prevalence 70%, 95% confidence, and ± 8% precision yielded a minimum sample of approximately 115.

## RESULTS

Of 1,354 individuals invited by email, 117 completed the questionnaire, corresponding to a response rate of 8.6%. Characteristics of participating physicians is snown in Table 1. Lifetime WPV was reported by 109 (93.2%) respondents and WPV during the preceding 12 months by 81 (69.2%). Lifetime verbal and physical violence were reported by 108 (92.3%) and 29 (24.8%), respectively; corresponding 12-month frequencies were 81 (69.2%) and 11 (9.4%).

Patients' relatives were most frequently identified as potential perpetrators, by 76 (65.0%) respondents, followed by patients, by 40 (34.2%). These responses reflected respondents' general perception of who was prone to violence rather than the perpetrator in a specific incident.

Pre-proof Med Clas (Zenica)

Overall WPV did not differ across sex categories for lifetime exposure ($\chi^2 = 3.57$, df = 2; $p = 0.168$) or exposure during the preceding 12 months ($\chi^2 = 2.36$, df = 2; $p = 0.308$).

Verbal WPV during the preceding 12 months was reported by 50/58 (86.2%; 95% CI 75.1–92.8) physicians in primary care, 11/20 (55.0%; 95% CI 34.2–74.2) in secondary care, and 20/35 (57.1%; 95% CI 40.9–72.0) in tertiary care ($\chi^2 = 12.415$, df = 2; $p = 0.002$) (Table 2). By healthcare level, lifetime physical WPV was reported by 15/59 (25.4%) in primary, 3/20 (15.0%) in secondary, and 11/36 (30.6%) in tertiary care ($p$=0.438). Twelve-month physical WPV was reported by 6/59 (10.2%), 3/21 (14.3%), and 2/37 (5.4%), respectively (exact $p = 0.438$). Lifetime verbal WPV was reported by 58/59 (98.3%), 18/19 (94.7%), and 32/35 (91.4%), respectively (exact $p = 0.243$) (Table 2).

In multivariable analysis, secondary care (OR 0.19, 95% CI 0.06–0.66; $p$=0.008) and tertiary care (OR 0.24, 95% CI 0.08–0.69; $p = 0.008$) were associated with lower odds of 12-month WPV than primary care. Sex (female vs male: OR 1.04, 95% CI 0.37–2.87; $p = 0.948$) and age group (per one-category increment: OR 0.84, 95% CI 0.50–1.40; $p = 0.497$) were not associated with WPV. The overall model was significant (likelihood-ratio $\chi^2 = 13.11$, df = 4; $p = 0.011$), with good calibration (Hosmer–Lemeshow $\chi^2 = 3.58$, df = 7; $p = 0.827$), AUC 0.690, and Nagelkerke $R^2 = 0.160$ (Table 3).

The most frequent responses to verbal violence were explaining one's actions, selected by 47 respondents (40.2% of the total sample), and reporting the incident to a supervisor, selected by 42 (35.9%). Following physical violence, 19 (16.2% of the total sample) reported the incident to a supervisor and 14 (12.0%) sought police protection.

Median satisfaction with institutional handling was 1 (IQR 1–2; n = 27) for physical violence and 1 (IQR 1–1; n = 85) for verbal violence; corresponding mean scores were 1.59 ± 0.89 and 1.41 ± 0.85. Concern about WPV had a median of 4 (IQR 3–5) and a mean of 3.86 ± 1.14 (n = 115; two invalid responses excluded) (Figure 1).

Pre-proof Med Glas (Zenica)

Concern about WPV was inversely correlated with satisfaction with institutional handling of verbal violence (Spearman's $\rho = -0.357$; $p = 0.001$; n = 86), but not with satisfaction regarding physical violence ($\rho = -0.307$; $p = 0.127$; n = 26) (Table 4).

The most frequently selected potential causes of WPV were patient psychological state, 42 (35.9%); poor health-system organisation, 40 (34.2%); and dissatisfaction with care, 36 (30.8%). The most frequently selected preventive measures were improved system organisation, 54 (46.2%); enhanced legal and physical protection of staff, 45 (38.5%); and stricter penalties for assaults on healthcare workers, 25 (21.4%).

## DISCUSSION

Among physicians who responded to this survey, WPV was frequently reported, verbal violence predominated, patients' relatives were commonly identified as perpetrators, and exposure during the preceding 12 months was more frequent in primary care. Satisfaction with institutional responses was low. Because only 8.6% of invited individuals responded, the findings may be substantially affected by self-selection and should not be interpreted as population-level prevalence estimates.

The reported lifetime and 12-month frequencies were higher than many estimates from low- and middle-income settings (19). However, comparisons across studies are limited by differences in instruments, recall periods, professional groups, healthcare settings, and response rates. Verbal violence generally predominates internationally, although reported estimates vary across Africa, Romania, India, Palestine, Jordan, Germany, Serbia, and the Western Balkans (20-27). Cultural and organisational factors may also influence both exposure and reporting (28).

Patients and their relatives are frequently identified as perpetrators of WPV in healthcare settings (7, 29-31). Emotional distress, dissatisfaction with care, organisational pressures, and broader social norms may contribute to aggressive behaviour (32-34). In the present survey,

Pre-proof Med Clas (Zenica)

respondents also emphasised system organisation and patient psychological state; however, these were perceptions rather than independently verified causes.

The higher frequency of WPV in primary care is consistent with earlier findings from Sarajevo primary care (13), although some studies have found greater exposure in hospital settings (35). Potential explanations include gatekeeping responsibilities, high patient volume, limited staffing, prolonged waiting, and differences in security infrastructure. These explanations were not directly tested in the present study.

Low satisfaction with institutional responses may contribute to persistent concern, underreporting, reduced job satisfaction, and staff attrition (36). Healthcare organisations should establish accessible reporting pathways, standardised post-incident procedures, staff training, and mechanisms for psychological and legal support. Organisational interventions and risk-management programmes may reduce WPV when implemented and evaluated systematically (37).

Legal and policy responses differ internationally, and several jurisdictions have introduced specific protections for healthcare workers (38-40). Whether current Bosnian and Herzegovinian legislation provides comparable protection has not been systematically assessed in this study and would require dedicated legal analysis against primary statutory sources. Prevention strategies should combine organisational improvement, adequate staffing, security measures, de-escalation training, and consistent institutional follow-up rather than relying on punitive measures alone.

This study has several limitations. The response rate was 8.6%, creating a substantial risk of non-response and self-selection bias. The cross-sectional design precludes causal inference, and career-long questions are susceptible to recall bias. The questionnaire was translated without formal reconciliation, back-translation, or pilot testing, which may have affected the comparability and psychometric robustness of the translated items. The adapted

Pre-proof Med Glas (Zenica)

questionnaire's measurement properties were not formally evaluated, and available-case analysis produced varying denominators. Some subgroup analyses involved small numbers, ordinal scales were summarised using both means and medians, and residual confounding may affect the regression estimates. The anonymous design also prevented comparison of respondents with non-respondents.

Larger studies using representative sampling, validated instruments, consistent incident definitions, and prospective reporting are needed. Future research should evaluate the effects of WPV on physician well-being, staff retention, patient safety, and healthcare delivery, as well as the effectiveness and costs of prevention programmes.

## CONCLUSION

WPV was frequently reported by physicians who responded to this survey, particularly those working in primary care, and satisfaction with institutional responses was low. The low response rate and voluntary sampling preclude population-level prevalence estimates. Standardised reporting systems, staff training, security measures, and clear institutional response protocols should be evaluated in larger, representative studies.

Pre-proof Med Glas (Zenica)

## ACKNOWLEDGEMENTS

The authors thank Raho Spahović, Aida Ahmed, Lejla Herenda, and Nermin Đapo for their support and advice; the Medical Association of Sarajevo Canton for distributing the survey invitation; and all participating physicians.

## FUNDING

No specific funding was received for this study.

## CONFLICTS OF INTEREST

None to declare.

## AUTHOR CONTRIBUTIONS (CRediT)

Conceptualization—V.H.; methodology—V.H. and D.H.; formal analysis—D.H.; investigation—V.H. and E.Ž.; data curation—D.H.; visualization—D.H.; writing—original draft—V.H.; writing—review and editing—V.H., E.Ž., and D.H.; supervision—V.H.; project administration—V.H. All authors have read and approved the final version of the manuscript.

## ETHICS STATEMENT

Formal ethics review was waived by the Medical Association of Sarajevo Canton because this was an anonymous, voluntary, minimal-risk online survey that collected no patient or directly identifying data. Proceeding to the questionnaire after viewing the study information constituted informed consent. The study was conducted in accordance with the Declaration of Helsinki and applicable data-protection requirements.

## DATA AVAILABILITY STATEMENT

The de-identified dataset, questionnaire, codebook, and analysis syntax supporting this study are available from Zenodo (doi: 10.5281/zenodo.21871769) without restriction for research purposes.

Pre-proof Med Glas (Zenica)

## REFERENCES

1. Kumari A, Kaur T, Ranjan P, Chopra S, Sarkar S, Baitha U. Workplace violence against doctors: characteristics, risk factors, and mitigation strategies. J Postgrad Med 2020;66:149-54. doi: 10.4103/jpgm.JPGM_96_20

2. International Labour Organization. Publications on International Labour Standards [Internet]. Geneva: ILO; [cited 2026 Apr 21]. Available from: https://www.ilo.org/global/standards/information-resources-and-publications/publications/lang--en/index.htm

3. Volonnino G, Spadazzi F, De Paola L, Arcangeli M, Pascale N, Frati P, et al. Healthcare workers: heroes or victims? Context of the western world and proposals to prevent violence. Healthcare (Basel) 2024;12:708. doi: 10.3390/healthcare12070708

4. American Medical Association. New AMA policy calls for research on violence against physicians [Internet]. Chicago: AMA; [cited 2024 Feb 23]. Available from: https://www.ama-assn.org/practice-management/physician-health/new-ama-policy-calls-research-violence-against-physicians

5. Kuhlmann E, Brinzac MG, Czabanowska K, Falkenbach M, Ungureanu MI, Valiotis G, et al. Violence against healthcare workers is a political problem and a public health issue: a call to action. Eur J Public Health 2023;33:4-5. doi: 10.1093/eurpub/ckac180

6. Rossi MF, Beccia F, Cittadini F, Amantea C, Aulino G, Santoro PE, et al. Workplace violence against healthcare workers: an umbrella review of systematic reviews and meta-analyses. Public Health 2023;221:50-9. doi: 10.1016/j.puhe.2023.05.021

7. World Health Organization. Preventing violence against health workers [Internet]. Geneva: WHO; [cited 2024 Aug 21]. Available from: https://www.who.int/activities/preventing-violence-against-health-workers

Pre-proof Med Clin (Zenica)

8. McLaughlin L, Khemthong U. The prevalence of type II workplace violence in US nurses 2000 to 2022: a meta-analysis. West J Nurs Res 2024;46:248-55. doi: 10.1177/01939459231222449

9. Lim MC, Jeffree MS, Saupin SS, Giloi N, Lukman KA. Workplace violence in healthcare settings: the risk factors, implications and collaborative preventive measures. Ann Med Surg (Lond) 2022;78:103727. doi: 10.1016/j.amsu.2022.103727

10. Pina D, Lopez-Ros P, Luna-Maldonado A, Luna Ruiz-Caballero A, Llor-Esteban B, Ruiz-Hernandez JA, et al. Users' perception of violence and conflicts with professionals in primary care centers before and during COVID-19: a qualitative study. Front Public Health 2021;9:810014. doi: 10.3389/fpubh.2021.810014

11. Banga A, Mautong H, Alamoudi R, Faisal UH, Bhatt G, Amal T, et al. ViSHWaS: violence study of healthcare workers and systems—a global survey. BMJ Glob Health 2023;8:e013101. doi: 10.1136/bmjgh-2023-013101

12. Eshah N, Al Jabri OJ, Aljboor MA, Abdalrahim A, ALBashtawy M, Alkhawaldeh A, et al. Workplace violence against healthcare workers: a literature review. SAGE Open Nurs 2024;10:23779608241258029. doi: 10.1177/23779608241258029

13. Jatic Z, Erkocevic H, Trifunovic N, Tatarevic E, Keco A, Sporisevic L, et al. Frequency and forms of workplace violence in primary health care. Med Arch 2019;73:6-10. doi: 10.5455/medarh.2019.73.6-10

14. Herenda V, Ziga E, Hrlovic D. Prevalence and impact of workplace violence against healthcare workers in Bosnia and Herzegovina. Croat Med J 2025;66:376-8. doi: 10.3325/cmj.2025.66.376

15. Tranberg M, Brodin EM. Physicians' lived experience of breaking bad news in clinical practice: five essentials of a relational process. Qual Health Res 2023;33:1349-59. doi: 10.1177/10497323231197534

Pre-proof Med Glas (Zenica)

16. International Labour Office, International Council of Nurses, World Health Organization, Public Services International. Workplace violence in the health sector: country case studies research instruments — survey questionnaire, English [Internet]. Geneva: ILO/ICN/WHO/PSI; 2003 [cited 2026 Apr 21]. Available from: https://cdn.who.int/media/docs/default-source/documents/violence-against-health-workers/wvquestionnaire.pdf

17. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. Spine (Phila Pa 1976) 2000;25:3186-91. doi: 10.1097/00007632-200012150-00014

18. Cochran WG. Sampling techniques. 3rd ed. New York: John Wiley & Sons; 1977.

19. Singh G, Singh A, Chaturvedi S, Khan S. Workplace violence against resident doctors: a multicentric study from government medical colleges of Uttar Pradesh. Indian J Public Health 2019;63:143-6. doi: 10.4103/ijph.IJPH_70_18

20. Njaka S, Edeogu OC, Oko CC, Goni MD, Nkadi N. Workplace violence (WPV) against healthcare workers in Africa: a systematic review. Heliyon 2020;6:e04800. doi: 10.1016/j.heliyon.2020.e04800

21. Rusu RE, Hanganu B, Iorga M, Rusu VC, Coman AE, Ioan BG. Workplace verbal violence toward Romanian doctors and nurses: prevalence, contributing factors, and psychological correlates. Healthcare (Basel) 2025;13:786. doi: 10.3390/healthcare13070786

22. Ghosh K. Violence against doctors: a wake-up call. Indian J Med Res 2018;148:130-3. doi: 10.4103/ijmr.IJMR_1299_17

23. Hamdan M, Abu Hamra A. Workplace violence towards workers in the emergency departments of Palestinian hospitals: a cross-sectional study. Hum Resour Health 2015;13:28. doi: 10.1186/s12960-015-0018-2

Pre-proof Med Clas (Zenica)

24. Alhamad R, Suleiman A, Bsisu I, Santarisi A, Al Owaidat A, Sabri A, et al. Violence against physicians in Jordan: an analytical cross-sectional study. PLoS One 2021;16:e0245192. doi: 10.1371/journal.pone.0245192

25. Vorderwulbecke F, Feistle M, Mehring M, Schneider A, Linde K. Aggression and violence against primary care physicians—a nationwide questionnaire survey. Dtsch Arztebl Int 2015;112:159-65. doi: 10.3238/arztebl.2015.0159

26. Terzic-Supic ZJ, Fisekovic-Kremic MB, Todorovic J, Santric-Milicevic MM, Nesic DM, Trajkovic GZ. Violence against primary health care workers in Serbia and measures for ensuring safe work environment. Iran J Public Health 2019;48:2304-5. doi: 10.18502/ijph.v48i12.3567

27. Pekez-Pavlisko T, Racic M, Gavran L, Pavlic DR, Sukriev L, Zivanovic SR, et al. Workplace violence and sanctioning of family medicine physicians due to the rules of health insurance funds in the Western Balkan. Mater Sociomed 2019;31:99-104. doi: 10.5455/msm.2019.31.99-104

28. Ariza-Montes A, Muniz NM, Montero-Simo MJ, Araque-Padilla RA. Workplace bullying among healthcare workers. Int J Environ Res Public Health 2013;10:3121-39. doi: 10.3390/ijerph10083121

29. Patricio SR, Ferrinho P, Sidat M. Violence against health care workers in the workplace in Mozambique—an unrecognised managerial priority. Int J Health Plann Manage 2022;37:2822-35. doi: 10.1002/hpm.3506

30. Ekpor E, Kobiah E, Akyirem S. Prevalence and predictors of workplace violence against nurses in Africa: a systematic review and meta-analysis. Health Sci Rep 2024;7:e2068. doi: 10.1002/hsr2.2068

Pre-proof Med Glas (Zenica)

31. Sari H, Yildiz I, Cagla Baloglu S, Ozel M, Tekalp R. The frequency of workplace violence against healthcare workers and affecting factors. PLoS One 2023;18:e0289363. doi: 10.1371/journal.pone.0289363

32. Berlanda S, Pedrazza M, Fraizzoli M, de Cordova F. Addressing risks of violence against healthcare staff in emergency departments: the effects of job satisfaction and attachment style. Biomed Res Int 2019;2019:5430870. doi: 10.1155/2019/5430870

33. Kostovicova D, Bojicic-Dzelilovic V, Henry M. Drawing on the continuum: a war and post-war political economy of gender-based violence in Bosnia and Herzegovina. Int Fem J Polit 2020;22:250-72. doi: 10.1080/14616742.2019.1692686

34. Storm-Mathisen F. "Violence is completely normal": managing violence through narrative normalization. Br J Criminol 2025;65:37-53. doi: 10.1093/bjc/azae030

35. Nevo T, Peleg R, Kaplan DM, Freud T. Manifestations of verbal and physical violence towards doctors: a comparison between hospital and community doctors. BMC Health Serv Res 2019;19:888. doi: 10.1186/s12913-019-4700-2

36. Johna S. The physician attrition crisis: a cross-sectional survey of the risk factors for reduced job satisfaction among US surgeons. World J Surg 2018;42:1293-4. doi: 10.1007/s00268-017-4352-5

37. Bianco L, Oliva S, Grassi F, Arena JF, Aromatario M, Ferracuti S, et al. Violence against healthcare workers in a university hospital of central Italy: how risk management interventions can help change a trend. Healthcare (Basel) 2025;13:409. doi: 10.3390/healthcare13040409

38. de Raeve P, Xyrichis A, Bolzonella F, Bergs J, Davidson PM. Workplace violence against nurses: challenges and solutions for Europe. Policy Polit Nurs Pract 2023;24:255-64. doi: 10.1177/15271544231182586

Pre-proof Med Clas (Zenica)

39. Parliament of New South Wales. Crimes Legislation Amendment (Assaults on Frontline Emergency and Health Workers) Bill 2022 [debate]. 2022 [cited 2025 Mar 14]. Available from: https://www.parliament.nsw.gov.au/Hansard/Pages/HansardResult.aspx#/docid/'HANSARD-1323879322-126645'

40. Nelson S, Leslie K, McCormick A, Gonsalves J, Baumann A, Thiessen NJ, et al. Workplace violence against nurses in Canada: a legal analysis. Policy Polit Nurs Pract 2023;24:239-54. doi: 10.1177/15271544231182583

Pre-proof Med Glas (Zenica)

## TABLES AND FIGURES

### Table 1. Characteristics of participating physicians (N = 117)

| Category | n (%) |
|---|---|
| **Sex** | |
| Not specified | 2 (1.7) |
| Male | 27 (23.1) |
| Female | 88 (75.2) |
| **Age group (years)** | |
| Not specified | 1 (0.9) |
| 20–29 | 12 (10.3) |
| 30–39 | 25 (21.4) |
| 40–49 | 49 (41.9) |
| ≥50 | 30 (25.6) |
| **Professional position** | |
| General practitioner | 16 (13.7) |
| Resident | 18 (15.4) |
| Specialist | 65 (55.6) |
| Subspecialist | 18 (15.4) |

N, total sample size; n, number of respondents

### Table 2. Workplace violence by level of healthcare

| Outcome | Primary care | Secondary care | Tertiary care | *p* |
|---|---|---|---|---|
| | | n/N (%) | | |
| Physical WPV (career) | 15/59 (25.4) | 3/20 (15.0) | 11/36 (30.6) | 0.438 |
| Physical WPV (past 12 months) | 6/59 (10.2) | 3/21 (14.3) | 2/37 (5.4) | 0.438* |
| Verbal WPV (career) | 58/59 (98.3) | 18/19 (94.7) | 32/35 (91.4) | 0.243* |
| Verbal WPV (past 12 months) | 50/58 (86.2) | 11/20 (55.0) | 20/35 (57.1) | 0.002 |

* Fisher–Freeman–Halton exact p value reported because the minimum expected cell count was <5. Pearson $\chi^2$ statistics are shown descriptively.
Values are n/N (%), calculated from valid responses for each item. Denominators vary because of missing responses.
WPV, workplace violence

### Table 3. Factors associated with workplace violence during the preceding 12 months

| Variable | B (SE) | OR | 95% CI | *p* |
|---|---|---|---|---|
| Intercept | 2.242 (0.966) | 9.410 | 1.416–62.521 | 0.020 |
| Healthcare level: Secondary care (ref: Primary care) | -1.639 (0.622) | 0.194 | 0.057–0.657 | 0.008 |
| Healthcare level: Tertiary care (ref: Primary care) | -1.425 (0.535) | 0.241 | 0.084–0.687 | 0.008 |
| Sex: Female (ref: Male) | 0.034 (0.521) | 1.035 | 0.373–2.872 | 0.948 |
| Age group (per one-category increment) | -0.179 (0.263) | 0.837 | 0.500–1.400 | 0.497 |

B, regression coefficient; CI, confidence interval; OR, odds ratio; ref, reference category; SE, standard error

Pre-proof Mart Glas (Zenica)

**Table 4. Correlation between concern about workplace violence and satisfaction with institutional responses**

| Outcome | Spearman's ρ | *p* | n |
|---|---|---|---|
| Satisfaction with handling of physical assault | -0.307 | 0.127 | 26 |
| Satisfaction with handling of verbal assault | -0.357 | 0.001 | 86 |

n, number of paired observations; WPV, workplace violence; ρ, Spearman's rank correlation coefficient

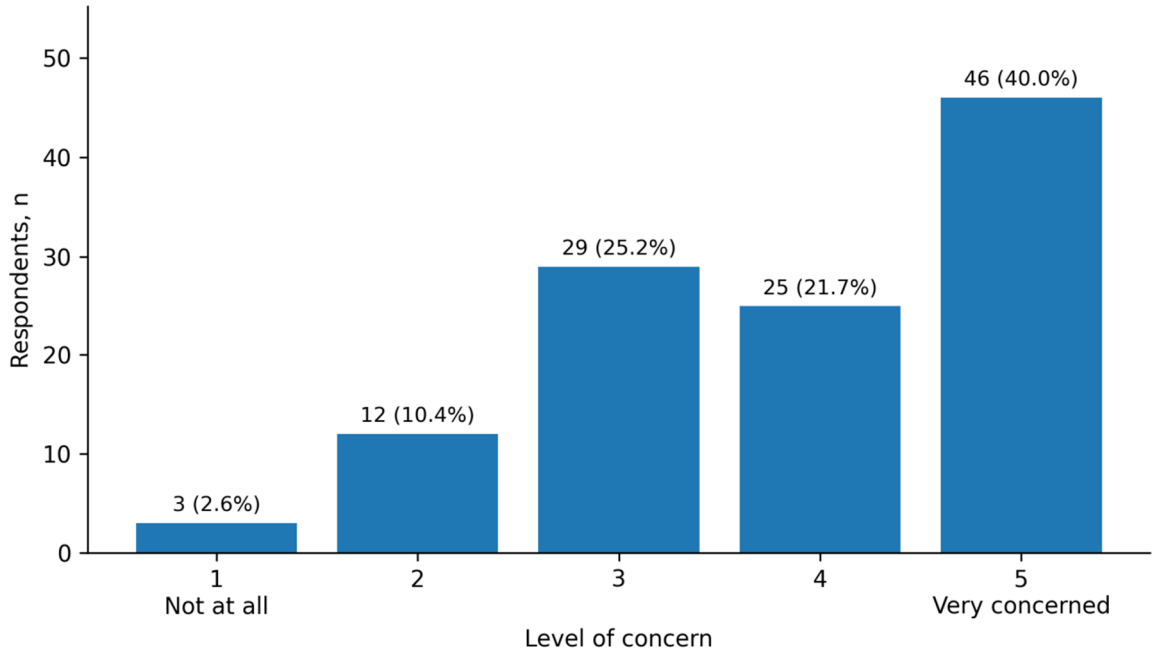



**Figure 1. Distribution of concern about workplace violence among respondents**
Two responses outside the valid 1–5 range were excluded.

Pre-proof Ma